



## News Release

U.S. Department of the Interior  
U.S. Geological Survey

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**Release**

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# Los Angeles Area with Most Water Wells is Least Vulnerable to Ground- Water Contamination

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Sacramento (September 26, 2001)—U.S. Geological Survey (USGS) scientists have found that the portion of the aquifers in the Los Angeles–Orange County area with the most wells — the “pressure area” — is less vulnerable to contamination than an area to the east — the “forebay”. This new USGS study used extremely low concentrations of volatile organic compounds (VOCs) such as chloroform, MTBE, and the solvent TCE, as environmental tracers to map ground-water flow at a regional scale. The study, part of the State Water Resources Control Board’s Groundwater Ambient Monitoring and Assessment Program (GAMA), was primarily designed to assess the susceptibility of public water supplies to contamination from land surface sources, such as leaking underground storage tanks. While the USGS detected extremely low levels of VOCs — levels often more than 100 times lower than drinking water limits — no new violations of drinking water criteria were found.

“Most surprisingly, we found that VOCs from sources at the land surface generally are not moving downward in the ground water and impacting active public supply wells in the pressure area” said Neil Dubrovsky, USGS Program Chief of the project. This lack of vulnerability is likely due to thick and extensive clay layers in this area that limit the downward movement of water from the surface to the active wells. The distribution of low-level VOCs appears, instead, to be the result of westward ground-water flow from the forebays to the pressure area. In contrast, in other urban parts of the country, the location of VOCs in ground water has been related to overlying VOC sources, such as leaking underground fuel tanks and high population density.

Although well below drinking water standards, VOCs were detected more frequently and at higher concentrations in the forebay areas in the eastern portion of the Los Angeles physiographic basin. Most of the ground-water recharge in the basin is in the forebays, and regional ground-water flow is generally west from the forebays toward the coast. This pattern of flow is reflected by the location of VOC detections. MTBE, in use for only about a decade, was detected almost exclusively in wells in the forebay, and thus, has not traveled far from the primary recharge area. MTBE was detected in 14% of the 178 wells sampled. In contrast, chloroform, a common byproduct of the disinfection of drinking water by chlorine, and present in the environment for decades, was widely distributed and has traveled up to 10 kilometers west of the forebay. Chloroform was present in 46% of the samples.

Vertical migration of contaminants from the land surface may be a viable mechanism for movement of VOCs to active public supply wells in the forebays because of its relative lack of extensive clay layers. In addition, analyses of samples from the Santa Ana River indicate that it could be the source of some of the VOCs — in particular, MTBE and chloroform — but not others. “We have to be cautious about our conclusions on the relation between surface-water and ground-water quality because we don’t have surface-water quality data from decades ago when the ground water that we sampled soaked into the ground” said Dubrovsky.

As the nation’s largest water, earth, and biological sciences, and civilian mapping agency, the USGS works in cooperation with more than 2,000 organizations across the country to provide reliable, impartial, scientific information to resource managers, planners, and other customers. This information is gathered in every state by USGS scientists to minimize the loss of life and property from natural disasters; to contribute to the sound conservation, economic, and physical development of the nation’s natural resources; and to enhance the quality of life by monitoring water, biological, energy, and mineral resources.

Copies of the U.S. Geological Survey Report Water Resources Investigations Report 01-4188, “Low-Level Volatile Organic Compounds in Active Public Supply Wells as Ground-Water Tracers in the Los Angeles Physiographic Basin, California, 2000.” The report can be found on

the Internet at <http://ca.water.usgs.gov/rep/wrir014188>. The report also is available for purchase from the U.S. Geological Survey, Branch of Information Services, Box 25286, Denver Federal Center, Denver, CO 80225. The price of the paper copy of the report is \$4.00. When ordering, please mention the report series and number and complete title of the report. Payment (check, money order, purchase order, Visa or MasterCard information, including expiration date and signature) in the exact amount, plus a \$3.50 handling fee per item, must accompany order. Make all drafts payable to U.S. Geological Survey, Department of Interior. The report is available for inspection at the following offices and libraries:

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